OMEGA
ELECTRONICS

ASC

ATHLETIC START CONTROL

User's Manual
3346.502.02
Version 1.2

Omega Electronics SA
Case postale 4161
CH-2500 Bienne 4
Switzerland

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1. GENERAL INSTRUCTIONS

1.1 Operation Principle

The ASC system allows to control the starts in athletics.

The starting blocks are equipped with a contact which reacts to the push of the competitor at the start.

The zero on the time scale is the exact moment that the starting shot is fired by the starter.

The human reaction time is more than a tenth of a second (100 ms). The ASC analysis is based on the starting shot. If a competitor pushes between "0" and "100 ms", the system emits a false start signal to the starter's headset and on the speaker starting block if wished.

The starter's headset is equipped with a microphone, allowing to give orders to the competitors through the speakers mounted on each starting block. These speakers are also used to transmit at start time either a synthesized starting shot or a starting beep.

This method makes sure that every competitor does hear the starting shot at the same moment. In fact, as the competitors are not at the same distance away from the starter (particularly in a 400 m race), and the sound propagates through the air with about 340 m/s, the signal from the starting block will reach the competitor before the direct sound of the starting gun.

The OGM 5005 can also be programmed to send a false-start beep to the speakers when a competitor starts too early.

1.2 System Overview

The ASC system consists of three components :

- **starting equipment**
- **control unit**
- **starting block units**

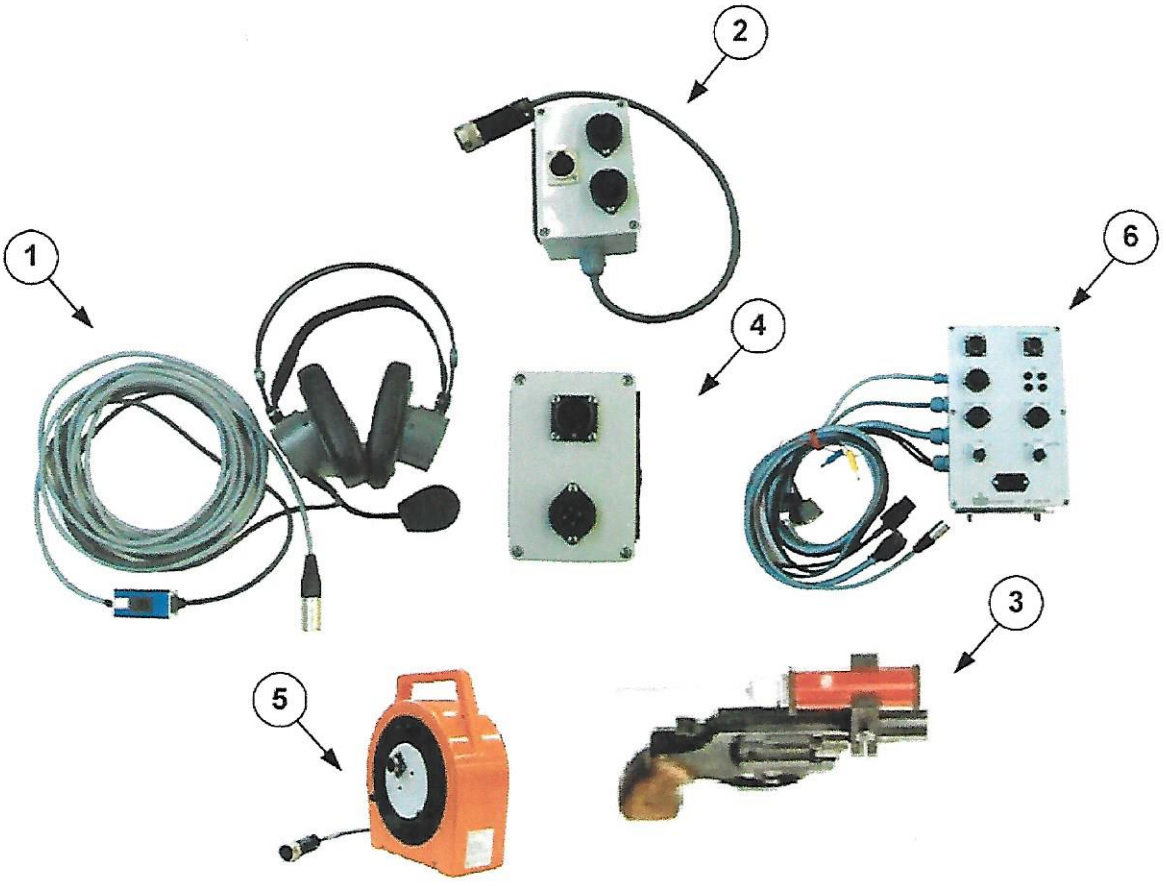
The components are described in the following.

! For all use with the ASC, the OST transducer must be selected in normally close !

1.3 Starting Equipment

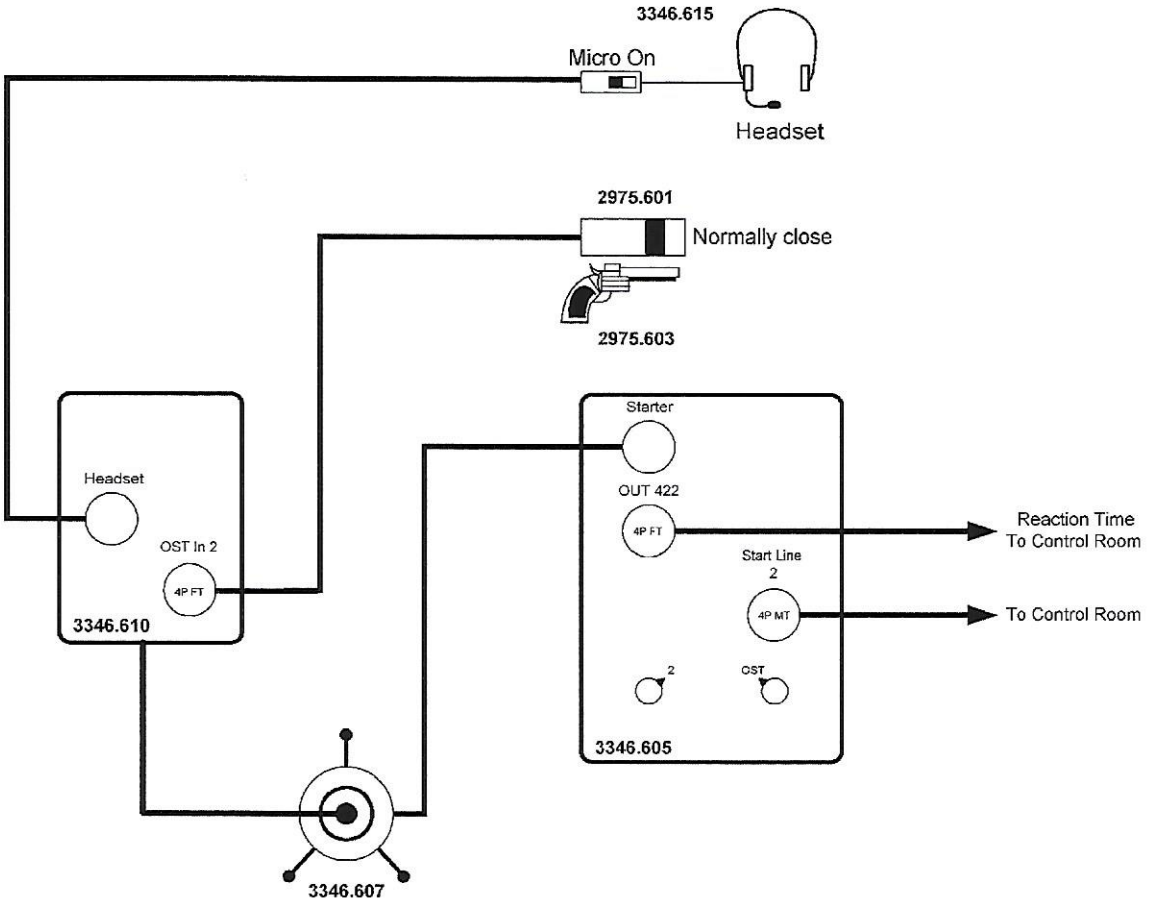
The starting equipment consists of :

1. 1 starter's headset (3346.615)
2. 1 starter connection box (3346.610)
3. 1 OST transducer (optional 2) (2975.601)
4. 1 1500 m starting box (3346.611)
5. 1 starter reel (3346.607)
6. 1 connection box (3346.605)



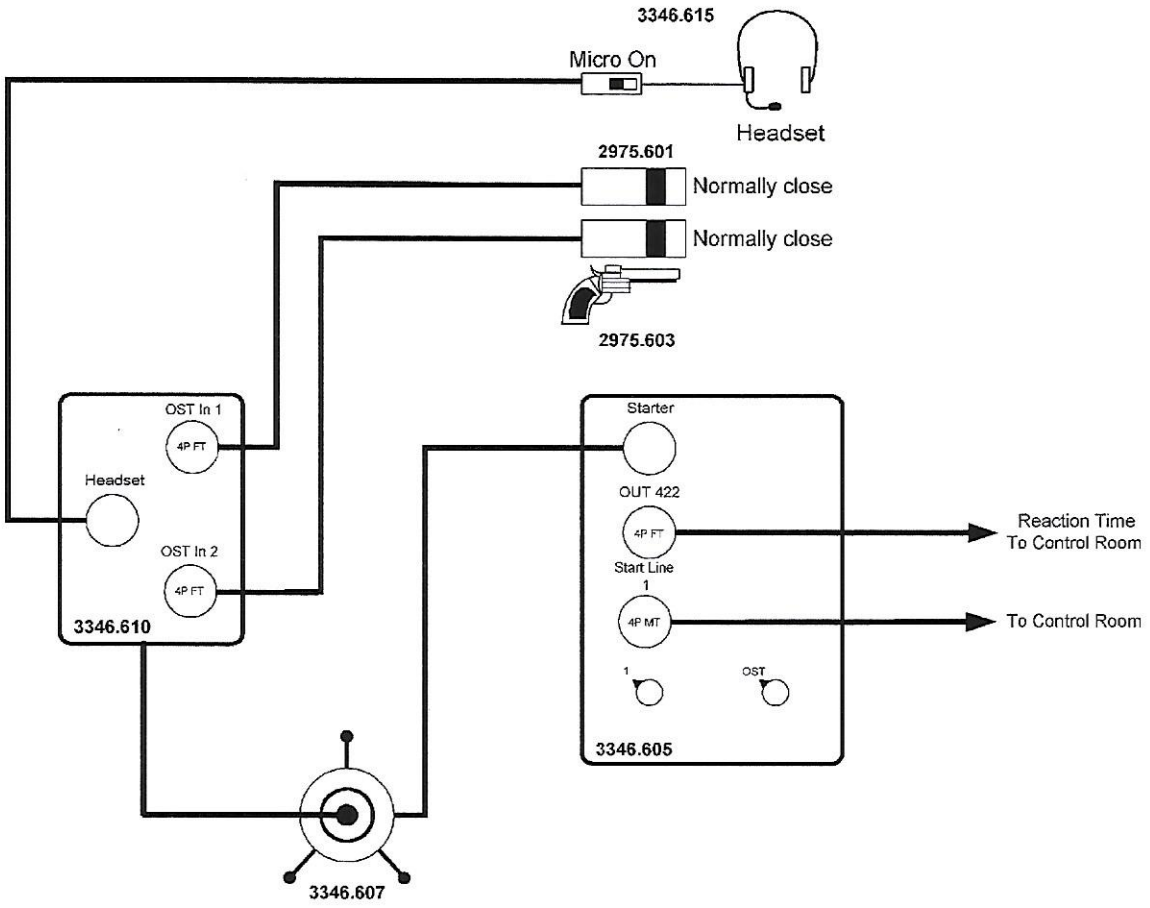
The reel contains a 20 m long cable. Up to two reels can be installed in a row.

If you use only one OST transducer, it must be connected to the OST IN2 entry of the starter box. Then the starter reel connects the starter box to the start LINE 2 entry of the ASC connection box. Switch LINE on position 2 and switch START on position OST.



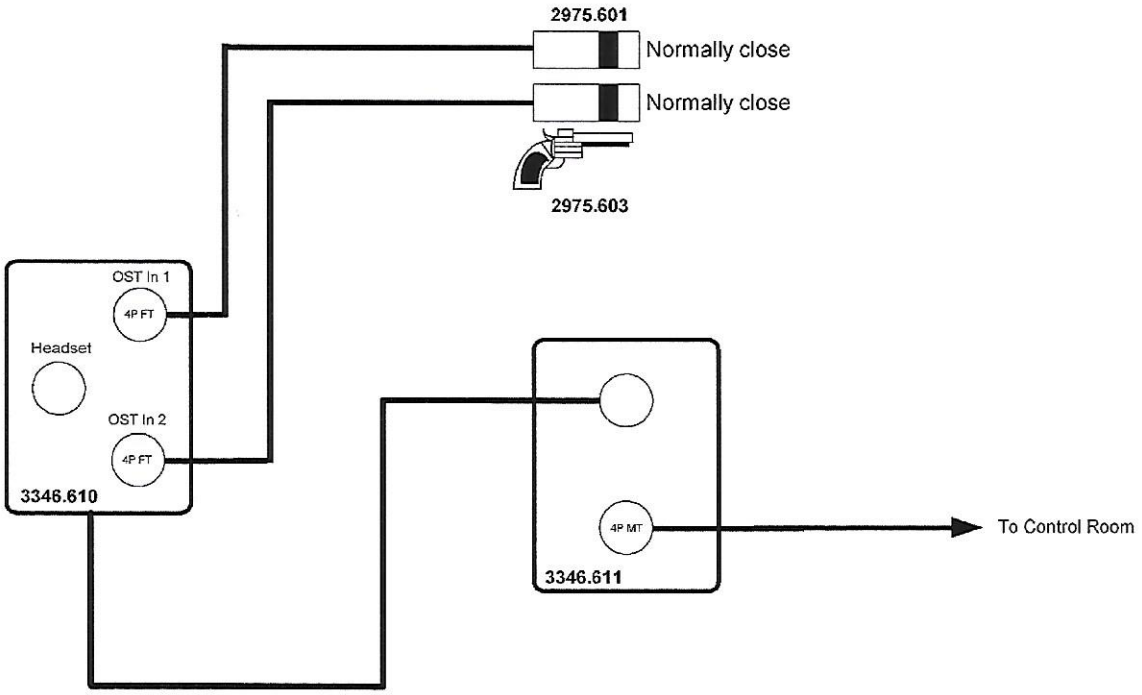
! ALL peripheral MUST BE connected before the control unit is switched on !

With two transducers, OST IN 1 and 2 must be connected. Then the starter reel connects the starter box to the start LINE 1 entry of the ASC connection box. Switch LINE on position 1 and switch START on position OST.



! ALL peripheral MUST BE connected before the control unit is switched on !

For a start with no ASC control unit (1500 m), connect the 12 pole plug to the 1500 m starting box, and connect this box to the starting circuitry with a 4 pole Tuchel cable.



The starter's headset has a box with a switch to interrupt the microphone line.

2. CONTROL UNIT

The control unit consists of :

- cart
- OGM 5005 unit
- control cabinet (ASC Central Unit)
- connection box (ASC Connection Box)
- OSM6 battery

The cart is made of aluminium.

The OGM 5005 unit is mounted on a drawer. It can be removed from the cart by loosening the two safety screws on each side of the drawer. A Plexiglas cover on sliding rails protects the OGM 5005 against rain.

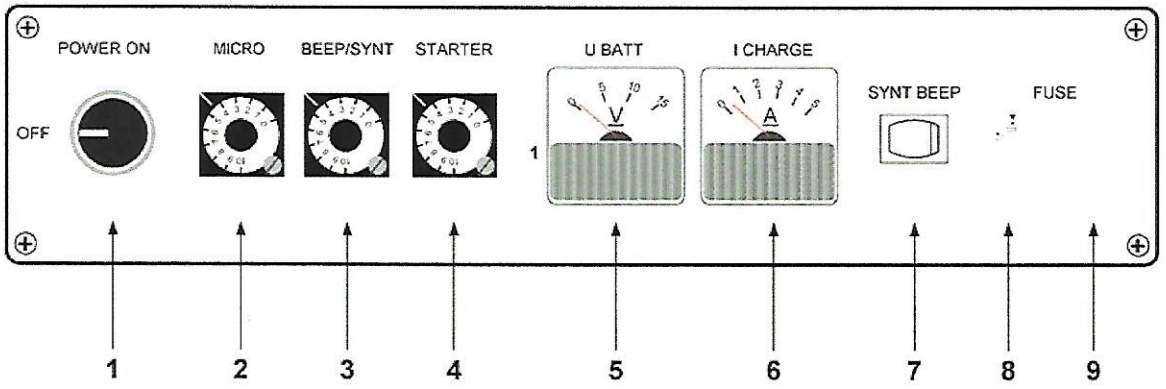
The control cabinet is mounted on a fixed plate. To remove it, unscrew the safety nuts below this plate and remove the unit. The control cabinet is wired on its back panel.

The OSM6 battery is mounted on the bottom of the cart with a strap. Unmount the battery when the system is not used for extended time. Unplug the plastic Tuchel plug of the battery. The battery powers the whole system. A fully charged battery provides power for about 8 hours.

The OGM 5005 unit must be equipped with a type HSI "Series Serialization" board, an AT SC1-E software module and a KS AT3 keyboard.

The control cabinet (ASC Central Unit) contains a signal processing board (for audio, relays, beeps, etc...), an automatic battery charger and a power amplifier.

3. ASC CENTRAL UNIT FRONT PANEL

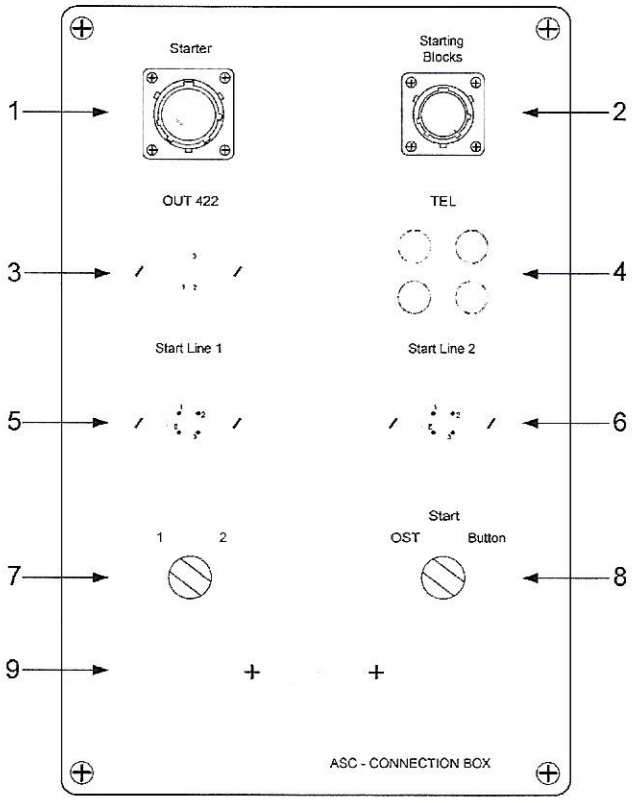


1. Start switch (electronic board, amplifier, twin reels)
2. Starter microphone volume
3. Starting block speaker volume (starting beep, false start beep, synthesized starting shot)
4. Starter's headset volume
5. Battery voltage indicator
6. Battery charge current indicator
7. Synthesized starting shot or starting beep selector
8. Line voltage selector
9. Line fuse (1 A temporised)

4. ASC CONNECTION BOX

The connection box is used to connect the peripherals to the central unit.

4.1 Description of the ASC Connection Box Front Panel



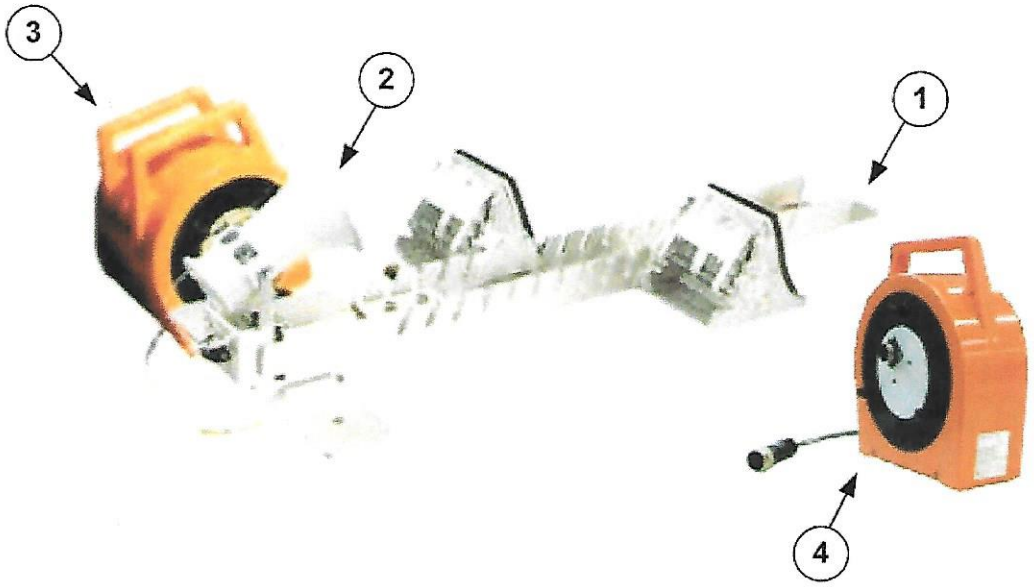
1. Starter reel socket
2. Twin reel socket
3. RS-422 output (OGM 5005 data) (pin 1: +, pin 2 : -)
4. Telephone line and phone connector (banana plugs)
5. Start impulse output (for ATS system)
6. Backup start line (wiring with ATS extension)
7. One- or two-line starting mode selector
   Note : in order to switch this selector, loosen the locking screw

8. Starting device selector (starting gun and OST or starting box with start button and false start button)
   Note : in order to switch this selector, loosen the locking screw
9. Power line socket

5. STARTING BLOCKS

The assembly consists of :

1. starting block
2. speaker
3. twin reel
4. extension reel



The Omega #2982-641 starting block (1) is equipped with a fixed mounted speaker on its upper part (2). The original control LED is replaced with a high-luminosity LED (1.8 V direct voltage).

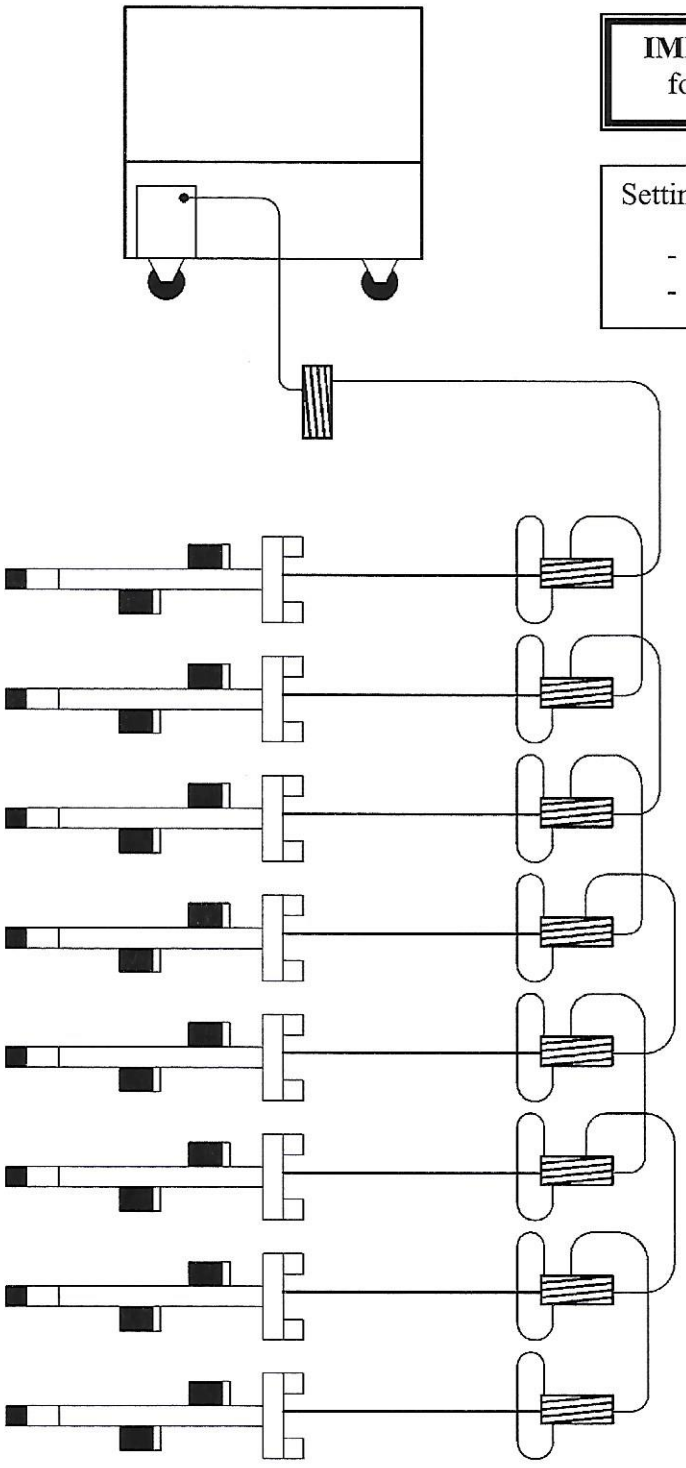
The Omega #3346.609 twin reels (3) connect the starting blocks to the control unit. They have an electronic control unit in the middle of one of the reels.

The connection cable between the reels is 20 m long.

The connection cables between the starting blocks and the reels are 16 m long.

The Omega #3346.708 reel extensions are 20 m long (4).

5.1 Wiring



IMPORTANT : Check the starting block force with an OMEGA dynamometer.

Settings depending on the distance :

- **100 m and 200 m : 30 to 32 kg.**
- **400 m : 28 to 30 kg**

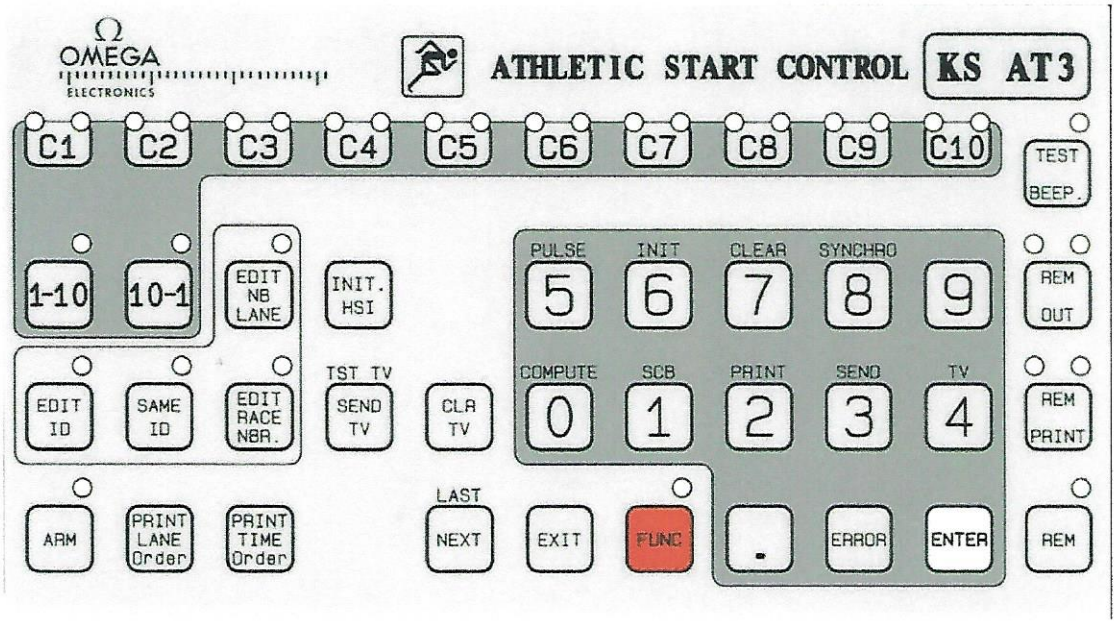
6. ASC : AT SC1-E WITH KS AT3 KEYBOARD FOR OGM 5005

6.1 Instructions

6.1.1 Communicating with the OGM 5005

Each time data entry is needed, the "_" cursor or the parameter to enter flashes at the appropriate location on the display. Data is entered with the numeric keypad or the <ENTER> key.
When a value is already displayed, it is a default value, or the previously entered value. To keep this value, press the <ENTER> key.

6.1.2 KS AT3 Keyboard



6.1.3 List of Keys and their Functions

The keyboard can be subdivided into the following zones :

- Starting block management keys
- Function keys
- Edit keys
- other keys

6.1.3.1 Starting Block Management Keys

<1-10>	The first twin reel connects the control unit to the starting block of lane 1.
<10-1>	The first twin reel connects the control unit to the starting block of the last lane (for example with 8 lanes, to lane 8).
<C1> to <C10>	No keys. Status indicators of the starting blocks. Green LED lit : valid start; yellow or red LED lit : false-start.

6.1.3.2 Function Keys

<FUNC> Access to the OGM 5005 functions (indicated below the keys).

<FUNC PULSE> Sending an impulse at a given time.

<FUNC INIT>

press 0 Setting the reaction time delay (0 = 100 ms after starting shot) ; 1 to 99 ms.

press 1 Setting the parameters of the beep sent to the starter.

TOTAL LENGTH Setting the time during which the starter will hear a false-start beep (0 = no beep)

DURATION ON Setting the length of the beep

DURATION OFF Setting the time between beeps

press 2 Setting the number of copies of the reaction times to be printed after a start.

press 3 Setting the I/0 3 delay.

press 4 Setting the parameters of the beep sent to the starting blocks.

TOTAL LENGTH Setting the time during which a false-start beep will sound (0 = no beep)

DURATION ON Setting the length of the beep

DURATION OFF Setting the time between beeps

press 5 Setting the time lag before the starting shot which the system will consider as false-start.

<FUNC CLEAR> Clearing the memory.

press 0 Deleting a selected start.

press 1 Deleting all starts (must be confirmed by pressing 1 again).

<FUNC SYNCHRO> Synchronizing the OGM 5005 with the time of the day.

<FUNC COMPUTE> Subtracting two times.

<FUNC SCB> Not used.

<FUNC PRINT>

press 0 Printing the reaction times of a selected start.

press 1 Printing the reaction times of all starts.

<FUNC SEND> Sending the results to the RS-232 interface.

<FUNC TV> Sending the results of a start to the RS 422 output.

<FUNC TST TV> Sending a test picture to the RS 422 output.

<FUNC LAST> Switching to the previous start.

<FUNC C1> Setting the printed identification.

<EXIT> Aborting the current function.

6.1.3.3 Edit Keys

<EDIT ID> Editing the title of the start to be printed on paper (for example : 100m HEAT 1 MEN). Follow a series of menus to edit the text. When synchronizing, it is possible to charge the start input.

<SAME ID> Changing the heat number, but keep the same title (faster).

<EDIT RACE NBR> Editing the RACE number (number under which the race/start is stored in memory).

<EDIT NB LANE> Setting the number of lanes actually used.

6.1.3.4 Other Keys

<0> to <9>	Number keys.
<ERROR>	Correcting the numbers entered through the numeric keypad.
<ENTER>	Confirm the data entered through the keyboard.
<REM PRINT>	Activated with the <REM> key. Enabling or disabling the printer to change paper.
<REM OUT>	Clearing all information on TV, as well as on the scoreboards. Activated with the <REM> key. To resend the information repeat these steps.
<TEST BEEP>	Sending the false-start signal to the starter and the starting block speakers for testing or demonstrating to the starter.
<INIT HSI>	Sending the initialization sequence for the control box in the ASC twin reels (after switching on the amplifier).
<SEND TV>	Sending the reaction times to the RS-422 output.
<CLR TV>	Clearing the reaction times sent to the RS-422 output.
<NEXT>	Proceeding to the following start.
<ARM>	Charging the start channel (a start impulse on this channel initiates the start control procedure).

<PRINT LANE Order>Printing an additional reaction time list in the lane number order.

<PRINT TIME Order>Printing a reaction time list in the time order.

6.2 Setting up the OGM 5005 Unit

6.2.1 Initialization

Commands and data are entered in dialogs (entry through the KS AT3 keyboard; response or question by the AT SC1-E program through displays and printer).

After starting up, the OGM 5005 unit requests the date and time (for example April 3, 2002) :

Enter **: 03 <ENTER> 04 <ENTER> 02<ENTER>**

The initialization parameters are printed out.

Synchronization :

<FUNC SYNCHRO>
Enter the time to synchronize
Charge the synchronization with **<EDIT ID>**
Give a start impulse to synchronize
(or press **<ARM>** if no synchronization shall occur).

Initializing the parameters :

<FUNC INIT>
Enter the various parameters (see section "Keys and their Functions")

Default working parameters :

REACTION TIME :	100 ms
STARTER BEEP-BEEP :	
TOTAL LENGTH	5000 ms
DURATION BEEP ON	500 ms
DURATION BEEP OFF	300 ms
NUMBER OF COPIES : 1	
TRACK BEEP-BEEP :	
TOTAL LENGTH	0 ms
DURATION BEEP ON	0 ms
DURATION BEEP OFF	0 ms

CONSIDERING FALSE START FROM – 35 ms TO GUN SHOT

7. OPERATING THE OGM 5005 UNIT

7.1 Preparation

- Check the remaining paper in the printer
- After switching on, enter date and time
- Verify the initialization parameters :

CONSIDERING FALSE START FROM – 35 ms TO GUN SHOT

REACTION TIME :	100 ms
STARTER BEEP-BEEP :	
TOTAL LENGTH	5000 ms
DURATION BEEP ON	500 ms
DURATION BEEP OFF	300 ms
TRACK BEEP-BEEP :	
TOTAL LENGTH	0 ms
DURATION BEEP ON	0 ms
DURATION BEEP OFF	0 ms

NUMBER OF COPIES : 1

Note : the OGM 5005 unit keeps the last entered parameters in memory until it is switched off.

Synchronize the time of the day :

<FUNC SYNCHRO>
Enter the time to synchronize
Charge the synchronization with <EDIT ID>
Give a start impulse to synchronize (or press <ARM> if no synchronization shall occur).

Completely clear the start memory :

<FUNC CLEAR>
1 : CLEAR ALL RACES
YES -> press <1>

Edit the number of lanes actually used :

<EDIT NB LANE>

Select the first connected lane :

<1-10> or <10-1>

Make sure that the race counter is set to 1:
RACE NB : 1

Edit the race/start identification :
<EDIT ID>

Switch on the ASC Central Unit :
<INIT HSI>
Check the starting blocks
Check the speakers
Check the starting line
Check the starter's headset beep

Note : to demonstrate the beep to the starter :
<TEST BEEP>

7.2 Operation During the Competition

Get ready for the first start :
<ARM>

After printing out the reaction times :
<NEXT>
<EDIT ID> or **<SAME ID>**
After a false-start, only press **<NEXT>.**

Get ready for the next start :
<ARM>

At the end of the day perform a global printout :
<FUNC PRINT>
1 : PRINT ALL RACES

Note : the RACE number is the number under which the reaction times of a given start are stored in memory.

IMPORTANT : **ALWAYS PRESS** the **<NEXT>** key after a start, in order to store the results in memory.